

FACT SHEET FOR NPDES PERMIT NO. WA0023353
CITY OF SUMNER WASTEWATER TREATMENT FACILITY

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INTRODUCTION

The Federal Clean Water Act (FCWA, 1972, and later modifications, 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System of permits (NPDES permits), which is administered by the Environmental Protection Agency (EPA). The EPA has delegated responsibility to administer the NPDES permit program to the State of Washington on the basis of Chapter 90.48 RCW which defines the Department of Ecology's authority and obligations in administering the wastewater discharge permit program.

The regulations adopted by the State include procedures for issuing permits (Chapter 173-220 WAC), technical criteria for discharges from municipal wastewater treatment facilities (Chapter 173-221 WAC), water quality criteria for surface and ground waters (Chapters 173-201A and 200 WAC), and sediment management standards (Chapter 173-204 WAC). These regulations require that a permit be issued before discharge of wastewater to waters of the state is allowed. The regulations also establish the basis for effluent limitations and other requirements which are to be included in the permit. One of the requirements (WAC 173-220-060) for issuing a permit under the NPDES permit program is the preparation of a draft permit and an accompanying fact sheet. Public notice of the availability of the draft permit is required at least thirty days before the permit is issued (WAC 173-220-050). The fact sheet and draft permit are available for review (see [Appendix A--Public Involvement](#) of the fact sheet for more detail on the Public Notice procedures).

The fact sheet and draft permit have been reviewed by the Permittee. Errors and omissions identified in this review have been corrected before going to public notice. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. The fact sheet will not be revised. Comments and the resultant changes to the permit will be summarized in Appendix D--Response to Comments.

GENERAL INFORMATION	
Applicant	City of Sumner 1104 Maple Street Sumner, WA 98390
Contributing Jurisdictions	City of Bonney Lake Pierce County 19306 Bonney Lave Blvd. 9116 Gravelly Lake Dr. SW Bonney Lake, WA 98390 Tacoma, WA 98499-3190
Facility Name and Address	Sumner Regional Wastewater Treatment Plant 13114 – 63 rd Street East Sumner, WA 98390
Type of Treatment	Activated Sludge with chlorine disinfection and aerobic sludge digestion
Discharge Location	White (Stuck) River near the confluence of the Puyallup River Latitude: 47° 12' 01" N Longitude: 122° 15' 16" W
Water Body ID Number	WA-10-1030

BACKGROUND INFORMATION

DESCRIPTION OF THE FACILITY

HISTORY

The City of Sumner Wastewater Treatment Plant was originally constructed in 1956 to serve the City of Sumner. In 1972, the facility was expanded and upgraded to a 2.0 million gallons per day (MGD) secondary treatment facility. In 1984, the City of Sumner entered into an Intergovernmental Agreement for Wastewater Facilities Management with the City of Bonney Lake, Pierce County, and the South Hill Sewer District. The Sumner WWTF was upgraded to 2.62 MGD, providing additional capacity for the new partners. The expanded facility began receiving combined flows in 1987. The South Hill Sewer District has since merged with Pierce County and no longer owns capacity in the facility. The last major modification was completed in 1990. Flows are monitored and the treatment plant influent is sampled separately for Sumner and for the joint facility serving Bonney Lake, and Pierce County.

On November 28, 1989, Ecology provisionally approved an engineering report titled "Wastewater Treatment Plant Improvements for Revised Design Criteria, dated November 1988. The approval letter states that modifications to design criteria and other conditions noted would be reflected in the permit at the time of renewal. The letter specifies the following issues that must be resolved before the additional capacity is granted in the permit:

1. Replacement of the portable influent pumping unit to handle peak influent flows in the event of an out-of-service screw pump with a permanent pumping unit.
2. Upgrading the barminutor facilities to meet Ecology's reliability criteria.

COLLECTION SYSTEM STATUS

Sumner:

The Sumner collection system is a conventional sewer system with eight lift/pumping stations. A pump station evaluation report titled "Sewage Pumping Facilities Evaluation" was submitted to Ecology in October 1987. Deficiencies found included inadequate capacity to pump incoming flows, the lack of telemetry alarm systems, the lack of adequate storage or emergency power at pump stations during power outages, and the identification of four automatic overflow points (North Pump Station, South Pump Station, Cherry Street Pump Station, and Treatment Plant Headworks).

An engineering report titled "City of Sumner, Sewer Collection System Comprehensive Plan," dated November 1989, was approved on February 23, 1990. This plan outlines problems existing within the system and a plan of action to correct these problems. Problems include aging pipes, direct storm water connections, other sources of infiltration and inflow, inadequate grades and settlement causing deposition of solids and backup of sewage, and growth-related capacity problems.

Sumner has taken action to remedy several of the deficiencies noted. Telemetry alarms have been installed, pump stations upgraded for portable generator connection, a portable generator is available for emergency power, and manually-operated gates have been installed on the North Pump Station, South Pump Station and treatment plant headworks bypass manholes. The North Pump Station force main and the WWTP Interceptor sewer lines have also been replaced.

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Sumner is in the process of completing a Comprehensive Stormwater Plan which should provide assistance in assessing and solving some of the inflow problems. However, the stormwater plan does not take the place of a systematic I/I reduction plan for the entire sewerage system.

The following items still need to be addressed:

1. The automatic bypass for the Cherry Street pump station has not been eliminated. The bypass line was scheduled to have a manual gate installed in 1991, however, the location of the manhole has made installation difficult. The manhole is located in the carport of a private, manufactured home residence. Apparently the home was constructed in the public right of way. Correction of this bypass involves moving the carport and/or relocating the sewer line. Sumner is working with legal counsel to resolve this problem.
2. The collection system is still experiencing capacity problems, especially related to surcharging sewer lines during storm events. Collection system assessment, rehabilitation, repair and/or upgrades are needed.
3. The Collection System Comprehensive Plan provides for phased pump station capacities to handle increasing flows. Additions to the collection system would be based on the ability to transport the flows to the treatment plant.

Bonney Lake/Pierce County:

The City of Bonney Lake collection system discharges to the City of Sumner wastewater treatment plant. The collection system is relatively new (mid 1980s) and the existing permit did not require special conditions for assessment, repair or upgrade of the collection system. The system has 15 lift stations which are equipped with telemetry/auto dialer alarms to City Hall. The system also has approximately 90 grinder pump installations. The existing system has no industrial users but does service several commercial establishments. Bonney Lake indicates that some repair work is needed to keep infiltration and inflow at acceptable levels.

Bonney Lake has an agreement with Pierce County that annexed areas stay within the county's jurisdiction. Pierce County has an approved General Sewer Plan with standard design criteria meeting Ecology's reliability requirements. Pierce County currently contributes two residential equivalents to the sewerage system. In 1992, two Pierce County sewer extensions are scheduled to discharge to the Bonney Lake sewer system. The Pierce County Sewer Plan is currently under revision.

TREATMENT PROCESSES

Flows from Bonney Lake and Pierce County enter the facility through a Parshall flume located offsite just east of the WWTF. Flow from Bonney Lake, Pierce County and the City of Sumner are then combined at the WWTF influent pump station and measured by an ultrasonic flow meter. The influent pump station consists of three spiral screw pumps that lift the raw sewage several feet into the influent channel. A portable raw sewage pump was acquired during modifications in 1991 to serve as a replacement if one of the screw pumps goes out of service. Flow then passes through a Royce mechanical bar screen with a bypass channel and a manual bar screen as backup. Sewage then flows from the influent channel to a single aerated grit chamber. Effluent from the grit chamber flows south through two barminutor units, where smaller rags and particulates are ground up. From the barminutors the screened and degritted sewage flows through the influent channel to the activated sludge basins. The aeration basins operate as a complete mix process and consist of three basins. Although the activated sludge process is normally operated as completely mixed, it is often operated as a single-stage nitrification process to achieve both

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BOD₅ removal and nitrification of ammonia during the summer months. From the aeration basins, the mixed liquor flows to the clarifier splitter box and proceeds to the secondary clarifiers. Clarifier number three is used continuously and numbers one and two are used during periods of high flow. Treated flow from the secondary clarifiers flows through a Parshall flume to the chlorine contact basin. After leaving contact basin number one water flows to a the larger chlorine contact basin number two which then flows to the effluent channel where it is dechlorinated prior to discharge.

Solids wasted from the bottom of the secondary clarifiers are pumped to the DAFT unit which densifies the WAS to between 5 and 6 percent solids. The thickened WAS is then pumped to either of the aerobic digesters, or to the thickened sludge holding tank for temporary storage. The aerobic digesters stabilize and reduce the volume of sludge in preparation for land application. Stabilized sludge from the aerobic digesters is disposed of by land application at several local farms and a few City-owned sites.

Major industrial contributions to the plant include the following:

1. Pacific Northwest Baking, Inc. – 11,500 gpd pretreated process wastewater permitted under state pretreatment permit ST 6079.
2. Integrated Ingredients, Inc. (formerly Fleischmanns Vinegar) – 12,000 gpd pretreated wastewater permitted under NPDES permit WA-0038598.
3. General Battery/Exide Corporation - 500 gpd pretreated wastewater permitted under state pretreatment permit ST 6026.
4. Westfarm Foods (formerly Beatrice Cheese Company) 150,000 gpd - has its own wastewater treatment facility and has not discharged to Sumner's collection system since 1988. Beatrice has the capability of discharging to the Sumner Plant, if necessary. The facility is permitted under NPDES Permit WA-0040185.

Treatment Plant Operator Certification

The Department of Ecology has classified this facility as a Class III Municipal Wastewater Treatment Plant. Chapter 70.95B RCW requires that every operator in responsible charge of operation and maintenance of a wastewater treatment plant be certified at a level equal to or higher than the classification rating of the treatment plant being operated. In addition, the operator in charge of each shift shall be certified at a level no lower than one below the plant classification.

The City of Sumner is in compliance with this requirement. The facility has six full-time operators and is staffed eight hours per day, seven days per week. The lead operator is certified as a Class 3.

Plans for Expansion

The facility plan for upgrades to the Sumner wastewater treatment facility was approved by Ecology on May 26, 2000. The recommended process scheme for the expansion of the City of Sumner Wastewater Facility is an expanded secondary activated sludge system incorporating primary clarifiers with thermophilic/mesophilic anaerobic sludge digestion.

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DISCHARGE OUTFALL

Effluent is discharged to the White River (Stuck River) approximately 140 feet upstream from the confluence with the Puyallup River via a 24 inch submerged outfall (no diffuser) located approximately 56 feet as measured from the top of the bank offshore at a depth of 4.5 feet at low river elevation (15 feet depth at high river elevation).

RESIDUAL SOLIDS

The treatment facilities remove solids during the treatment of the wastewater at the headworks (grit and screenings), and at the secondary clarifiers, in addition to incidental solids (rags, scum, and other debris) removed as part of the routine maintenance of the equipment. Grit, rags, scum and screenings are drained and disposed of as solid waste at the local landfill. Solids removed from the secondary clarifiers are treated in the aerobic digesters and land applied under a permit from the Tacoma-Pierce County Health Department.

PERMIT STATUS

An application for permit renewal was submitted to the Department on January 20, 1999, and accepted by the Department on November 1, 2000.

The previous permit for this facility was issued on September 29, 1992. The previous permit placed effluent limitations on 5-day Biochemical Oxygen Demand (BOD₅), Total Suspended Solids (TSS), pH, Fecal Coliform bacteria, Chlorine Residual, Total Ammonia as N, Total Recoverable Copper, and Total Recoverable Mercury.

	EFFLUENT LIMITATION FLOWS \leq 2.62 MGD	
Parameter	Average Monthly	Average Weekly
Biochemical Oxygen Demand ^b (5 day)	30 mg/L, 655 lbs/day 85% Removal	45 mg/L, 983 lbs/day
Total Suspended Solids ^b	30 mg/L, 655 lbs/day 85% Removal	45 mg/L, 983 lbs/day
Fecal Coliform Bacteria	200/100 mL	400/100 mL
pH ^c	Daily minimum is equal to or greater than 6 and the daily maximum is less than or equal to 9.	
Parameter	Average Monthly	Maximum Daily^d
Total Residual Chlorine	0.018 mg/L	0.048 mg/L
Total Ammonia (as NH ₃ -N) (May-Oct) (Nov-Apr)	4.5 mg/L, 7 mg/L	10.5 mg/L, 213 lbs/day 20.5 mg/L
Total Recoverable Copper	16 µg/L	24 µg/L
Total Recoverable Mercury	0.4 µg/L	---

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	EFFLUENT LIMITATION FLOWS ≤ 3.43 MGD & ≥ 2.62	
Parameter	Average Monthly	Average Weekly
Biochemical Oxygen Demand ^b (5 day)	30 mg/L, 855 lbs/day Removal 85%	45 mg/L, 1284 lbs/day
Total Suspended Solids ^b	30 mg/L, 855 lbs/day Removal 85%	45 mg/L, 1284 lbs/day
Fecal Coliform Bacteria	200/100 mL	400/100 mL
pH ^c	Daily minimum is equal to or greater than 6 and the daily maximum is less than or equal to 9.	
Parameter	Average Monthly	Maximum Daily ^d
Total Residual Chlorine	0.015 mg/L	0.040 mg/L
Total Ammonia (as NH ₃ -N) (May-Oct) (Nov-Apr)	3.6 mg/L 5.8 mg/L	8.5 mg/L, 213 lbs/day 17.6 mg/L
Total Recoverable Copper	14 µg/L	20 µg/L
Total Recoverable Mercury	0.3 µg/L	---

SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT

The facility received its last inspection on August 27, 1998. It was noted in the report that the plant was aging and much equipment is in need of repair or replacement. Sumner has been waiting to complete their facility plan (Approved by Ecology on May 26, 2000) before investing in major improvements. The treatment plant does not meet existing reliability and may have difficulty meeting NPDES Permit effluent limits if average flows increase.

Since September of 1992 the Sumner wastewater facility had three violations for Fecal Coliforms, two violations for Total Recoverable Copper and Mercury, and four violations for Total Ammonia as N.

WASTEWATER CHARACTERIZATION

The concentration of pollutants in the discharge was reported in the NPDES application and in discharge monitoring reports. The effluent is characterized as follows:

Table 1: Wastewater Characterization

<u>Parameter</u>	<u>Concentration</u>
Flow, maximum month average	2.59 MGD
pH (lowest/highest)	6.9/7.2 units
Fecal Coliform Bacteria	97/100 mL
BOD (5 day), maximum monthly average	24 mg/L
Total Residual Chlorine, maximum monthly average	0.033 mg/L
TSS, maximum monthly average	30 mg/L
Ammonia (as N), maximum monthly average	6.63 mg/L

PROPOSED PERMIT LIMITATIONS

Federal and State regulations require that effluent limitations set forth in a NPDES permit must be either technology or water quality based. Technology based limitations for municipal discharges are set by regulation (40 CFR 133, and Chapters 173-220 and 173-221 WAC). Water quality based limitations are based upon compliance with the Surface Water Quality Standards (Chapter 173-201A WAC), Ground Water Standards (Chapter 173-200 WAC), Sediment Quality Standards (Chapter 173-204 WAC) or the National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992.) The most stringent of these types of limits must be chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.

The limits in this permit are based in part on information received in the application. The effluent constituents in the application were evaluated on a technology and water quality basis. The limits necessary to meet the rules and regulations of the State of Washington were determined and included in this permit. Ecology does not develop effluent limits for all pollutants that may be reported on the application as present in the effluent. Some pollutants are not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation. Effluent limits are not always developed for pollutants that may be in the discharge but not reported as present in the application. In those circumstances the permit does not authorize discharge of the non-reported pollutants. Effluent discharge conditions may change from the conditions reported in the permit application. If significant changes occur in any constituent, as described in 40 CFR 122.42(a), the Permittee is required to notify the Department of Ecology. The Permittee may be in violation of the permit until the permit is modified to reflect additional discharge of pollutants.

DESIGN CRITERIA

WAC 173-220-130(1)(a) states that effluent limitations shall not be less stringent than those based upon the treatment facility design efficiency contained in approved engineering plans and reports or approved revisions thereto. WAC 173-220-150(1)(g) states that where design criteria have been established, the Permittee shall not allow flows or waste loadings to exceed approved design criteria.

The design criteria for this treatment facility are taken from Final Comprehensive Facility Plan prepared by Kennedy/Jenks Consultants, January, 1999, and are as follows:

Table 2: Design Standards for the City Sumner WWTP.

Parameter	Design Quantity Interim	Design Quantity Final
Monthly average flow (max. month)	2.62 MGD	3.43 MGD
Instantaneous peak flow	6.56 MGD	8.55 MGD
BOD ₅ influent loading	5,800 lb./day	6,400 lb./day
TSS influent loading	5,200 lb./day	6,400 lb./day

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

Municipal wastewater treatment plants are a category of discharger for which technology-based effluent limits have been promulgated by federal and state regulations. These effluent limitations are given in the Code of Federal Regulations (CFR) 40 CFR Part 133 (federal) and in Chapter 173-221 WAC (state). These regulations are performance standards that constitute all known available and reasonable methods of prevention, control, and treatment for municipal wastewater.

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The following technology-based limits for pH, fecal coliform, BOD₅, and TSS are taken from Chapter 173-221 WAC are:

Table 3: Technology-based Limits.

Parameter	Limit
pH:	shall be within the range of 6 to 9 standard units.
Fecal Coliform Bacteria	Monthly Geometric Mean = 100 organisms/100 mL Weekly Geometric Mean = 200 organisms/100 mL
BOD ₅ (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit is 45 mg/L
TSS (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit is 45 mg/L

The following technology-based mass limits are based on WAC 173-220-130(3)(b) and 173-221-030(11)(b).

Interim monthly effluent mass loadings (lbs./day) were calculated as the maximum monthly design flow (≤ 2.62 MGD) x Concentration limit (30 mg/L) x 8.34 (conversion factor) = mass limit 655 lb./day. The weekly average mass loading is calculated as 1.5 x Monthly Average = 983 lb./day.

Final monthly effluent mass loadings (lbs./day) were calculated as the maximum monthly design flow (≤ 3.43 MGD) x Concentration limit (30 mg/L) x 8.34 (conversion factor) = mass limit 858 lb./day. The weekly average maximum mass loading was set by the Puyallup TMDL at 1284 lb./day.

SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS

In order to protect existing water quality and preserve the designated beneficial uses of Washington's surface waters, WAC 173-201A-060 states that waste discharge permits shall be conditioned such that the discharge will meet established Surface Water Quality Standards. The Washington State Surface Water Quality Standards (Chapter 173-201A WAC) is a state regulation designed to protect the beneficial uses of the surface waters of the state. Water quality-based effluent limitations may be based on an individual waste load allocation (WLA) or on a WLA developed during a basin-wide total maximum daily loading study (TMDL).

NUMERICAL CRITERIA FOR THE PROTECTION OF AQUATIC LIFE

"Numerical" water quality criteria are numerical values set forth in the State of Washington's Water Quality Standards for Surface Waters (Chapter 173-201A WAC). They specify the levels of pollutants allowed in a receiving water while remaining protective of aquatic life. Numerical criteria set forth in the Water Quality Standards are used along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are

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more stringent or potentially more stringent than technology-based limitations, they must be used in a permit.

NUMERICAL CRITERIA FOR THE PROTECTION OF HUMAN HEALTH

The state was issued 91 numeric water quality criteria for the protection of human health by the U.S. EPA (EPA 1992). These criteria are designed to protect humans from cancer and other disease and are primarily applicable to fish and shellfish consumption and drinking water from surface waters.

NARRATIVE CRITERIA

In addition to numerical criteria, "narrative" water quality criteria (WAC 173-201A-030) limit toxic, radioactive, or deleterious material concentrations below those which have the potential to adversely affect characteristic water uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health. Narrative criteria protect the specific beneficial uses of all fresh (WAC 173-201A-130) and marine (WAC 173-201A-140) waters in the State of Washington.

ANTIDEGRADATION

The State of Washington's Antidegradation Policy requires that discharges into a receiving water shall not further degrade the existing water quality of the water body. In cases where the natural conditions of a receiving water are of lower quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. Similarly, when the natural conditions of a receiving water are of higher quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. More information on the State Antidegradation Policy can be obtained by referring to WAC 173-201A-070.

The Department has reviewed existing records and is unable to determine if ambient water quality is either higher or lower than the designated classification criteria given in Chapter 173-201A WAC; therefore, the Department will use the designated classification criteria for this water body in the proposed permit. The discharges authorized by this proposed permit should not cause a loss of beneficial uses.

CRITICAL CONDITIONS

Surface water quality-based limits are derived for the waterbody's critical condition, which represents the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or characteristic water body uses.

MIXING ZONES

The Water Quality Standards allow the Department of Ecology to authorize mixing zones around a point of discharge in establishing surface water quality-based effluent limits. Both "acute" and "chronic" mixing zones may be authorized for pollutants that can have a toxic effect on the aquatic environment near the point of discharge. The concentration of pollutants at the boundary of these mixing zones may not exceed the numerical criteria for that type of zone. Mixing zones can only be authorized for discharges that are receiving all known, available, and reasonable methods of prevention, control and treatment (AKART) and in accordance with other mixing zone requirements of WAC 173-201A-100.

The National Toxics Rule (EPA, 1992) allows the chronic mixing zone to be used to meet human health criteria.

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Mixing Zone Descriptions

The maximum boundaries of the mixing zones are defined as follows:

Length:

Chronic: 100 feet upstream, 304 feet downstream

Acute: 10 feet upstream, 31 feet downstream

Width:

36 feet (18 feet east side from centerline of outfall port)

DESCRIPTION OF THE RECEIVING WATER

The White (Stuck) River is part of the Puyallup River basin and is designated as a Class A freshwater receiving water in the vicinity of the outfall. Characteristic uses include the following: water supply (domestic, industrial, agricultural), stock watering, fish migration, rearing, spawning and harvesting, wildlife habitat, primary contact recreation, sport fishing, boating and aesthetic enjoyment, commerce and navigation.

SURFACE WATER QUALITY CRITERIA

Applicable criteria are defined in Chapter 173-201A WAC for aquatic biota. In addition, U.S. EPA has promulgated human health criteria for toxic pollutants (EPA 1992). Criteria for this discharge are summarized below:

Fecal Coliforms	100 organisms/100 mL maximum geometric mean
Dissolved Oxygen	8 mg/L minimum
Temperature	18 degrees Celsius maximum or incremental increases above background
pH	6.5 to 8.5 standard units
Turbidity	less than 5 NTUs above background
Toxics	No toxics in toxic amounts (see Appendix C for numeric criteria for toxics of concern for this discharge)

PUYALLUP RIVER BASIN TOTAL MAXIMUM DAILY LOAD FOR BOD AND AMMONIA

Section 303(d) of the Clean Water Act requires states and the EPA to establish total maximum daily loads (TMDLs) for waters which cannot meet water quality standards after application of technology based controls. Due to the potential for dissolved oxygen problems in the lower Puyallup River, the Department established a seasonal TMDL for ammonia and biochemical oxygen demand (BOD) throughout the Puyallup River basin and tributaries effective May 1, through October 31. The maximum loadings established for this river basin were set at 20,322 pounds per day of BOD₅ and 3350 pounds per day of Ammonia as N. This includes an unallocated reserve capacity of 3,670 pounds per day of BOD₅ and 1,200 pounds per day of ammonia.

Wasteload allocations (WLAs) established for the Sumner Wastewater Treatment Plant discharge are 1,284 pounds per day of BOD₅ and 213 pound per day of Ammonia as N.

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The TMDL also provides an option to dischargers allowing them to reduce the WLA for ammonia for an increase in the WLA for BOD₅ since both parameters together influence dissolved oxygen. For each pound of ammonia reduction, the WLA for BOD₅ may increase by 13.4 pounds per day. The net effect of this change in the allocation is considered negligible.

In addition, a mediation settlement on May 29, 1998, established a process for allocation of the reserve capacity. A municipal reserve account was established for the City of Sumner as 267 pounds/day of BOD₅ and 86.7 pounds/day of Ammonia (or 1,428 pounds/day of BOD₅ if ammonia allocation was exchanged according to the procedure mentioned above). This reserve account may be accessed in accordance with the provisions of the settlement agreement.

CONSIDERATION OF SURFACE WATER QUALITY-BASED LIMITS FOR NUMERIC CRITERIA

Pollutant concentrations in the proposed discharge exceed water quality criteria with technology-based controls which the Department has determined to be AKART. A mixing zone is authorized in accordance with the geometric configuration, flow restriction, and other restrictions for mixing zones in Chapter 173-201A WAC.

The dilution factors of effluent to receiving water that occur within these zones have been determined at the critical condition by the using the percent of flow allowable criteria under WAC 173-201A-100(7) and are defined as follows:

	≤ 2.62 MGD		≤ 3.43 MGD	
	Acute	Chronic	Acute	Chronic
Annual 7Q10	1.8	13.3	1.6	10.4
Summer (May to October) 7Q20	2.4	18.1	2.1	14.0
Winter (November to April) 7Q20	2.2	20.7	1.9	16.1

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near field) or at a considerable distance from the point of discharge (far field). Toxic pollutants, for example, are near-field pollutants--their adverse effects diminish rapidly with mixing in the receiving water. Conversely, a pollutant such as BOD is a far-field pollutant whose adverse effect occurs away from the discharge even after dilution has occurred. Thus, the method of calculating water quality-based effluent limits varies with the point at which the pollutant has its maximum effect.

The derivation of water quality-based limits also takes into account the variability of the pollutant concentrations in both the effluent and the receiving water.

The critical condition for the White (Stuck) River is the seven-day average low river flow with a recurrence interval of ten years (7Q10) and for seasonal parameters (7Q20). The ambient background data used for this permit includes the following from Water Quality Monitoring Station 10C070 White River @ Sumner River Mile 0.7:

Parameter	Value used
7Q10 low flow	199 cfs
Velocity 7Q10	1.01 ft/sec
Depth 7Q10	1.43 feet

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Parameter	Value used
Width	136 feet
7Q20 low flow (May-Oct)	168 cfs
Velocity 7Q20 (May-Oct)	0.94 ft/sec
Depth 7Q20 (May-Oct)	1.30 feet
7Q20 low flow (Nov – Apr)	320 cfs
Velocity 7Q20 (Nov – Apr)	1.22 ft/sec
Depth 7Q20 (Nov – Apr)	1.91 feet
Roughness (Manning)	n=0.04
Slope	4.66 E-03
Temperature 7Q10	16.0° C
Temperature 7Q20 (May-Oct)	17.2° C
Temperature 7Q20 (Nov-Apr)	10.1° C
pH (high) 7Q10	7.6
pH (high) 7Q20 (May-Oct)	7.6
pH (high) 7Q20 (Nov-Apr)	7.7
Dissolved Oxygen 7Q10	11.05 mg/L
Dissolved Oxygen 7Q20 (May-Oct)	10.13 mg/L
Dissolved Oxygen 7Q20 (Nov-Apr)	11.99 mg/L
Total Ammonia-N 7Q10	0.093 mg/L
Total Ammonia-N 7Q20 (May-Oct)	0.066 mg/L
Total Ammonia-N 7Q20 (Nov-Apr)	0.10 mg/L
Fecal Coliform	353/100 mL
Conductivity	69.08
Turbidity	20.98 NTU
Hardness	24.4 mg/L as CaCO ₃

BOD₅--Under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters. Therefore, the technology-based effluent limitation for BOD₅ was placed in the permit along with the mass load limit set in the Puyallup TMDL.

Temperature and pH--The impact of pH and temperature were modeled using the calculations from EPA, 1988. The input variables were dilution factor 1.6, upstream temperature 13.9 °C, upstream pH 7.37, upstream alkalinity 49 (as mg CaCO₃/L), effluent temperature 20.4 °C, effluent pH of 6.9, effluent pH of 7.39, and effluent alkalinity 150 (as mg CaCO₃/L).

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Under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters. Therefore, the technology-based effluent limitations for pH was placed in the permit and temperature was not limited but will be monitored.

Fecal Coliform-- The ambient conditions indicate that the fecal coliform water quality limits are exceeded in the receiving water. Fecal coliform is therefore limited to the water quality standard geometric mean value of 100 colonies/100 mL with no more than 10 percent of all samples obtained for calculating the geometric mean value exceeding 200 colonies/ 100 mL.

Toxic Pollutants--Federal regulations (40 CFR 122.44) require NPDES permits to contain effluent limits for toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria. This process occurs concurrently with the derivation of technology-based effluent limits. Facilities with technology-based effluent limits defined in regulation are not exempted from meeting the Water Quality Standards for Surface Waters or from having surface water quality-based effluent limits.

The following toxics were determined to be present in the discharge: chlorine, ammonia, and heavy metals. A reasonable potential analysis (See Appendix C) was conducted on these parameters to determine whether or not effluent limitations would be required in this permit.

The determination of the reasonable potential for (Chlorine, Total Ammonia as NH₃-N, Copper, Mercury, and Zinc) to exceed the water quality criteria were evaluated with procedures given in EPA, 1991 (Appendix C) at the critical condition. The critical condition in this case occurs May 1, through October 31. The parameters used in the critical condition modeling are as follows: < 2.62 MGD, acute dilution factor 1.8, chronic dilution factor 13.3, < 3.43 MGD; acute dilution factor 1.6, chronic dilution factor 10.4; receiving water temperature 17.2 °C; (< 2.62 MGD using a river/effluent blend) chronic receiving water hardness 29.74 and acute hardness 64.84 (as mg CaCO₃/L), and (< 3.43 MGD using a river/effluent blend) chronic receiving water hardness 31.23 and acute hardness 69.41 (as mg CaCO₃/L).

Effluent limits were derived for Chlorine, Copper, Mercury, and Zinc, which were determined to have a reasonable potential to cause a violation of the Water Quality Standards. Effluent limits were calculated using methods from EPA, 1991 as shown in Appendix C.

No valid ambient background data was available for Copper and Mercury. The Permittee is required in section S8 of the proposed permit to collect background concentrations near the point of discharge. This information may result in a permit modification or limits in the next renewal

The resultant effluent limits are as follows:

Parameter < 2.62 MGD	Average Monthly	Maximum Daily^d
Total Residual Chlorine	0.013 mg/L	0.033 mg/L
Total Ammonia (as NH ₃ -N) (May-Oct) (Nov-Apr)	4.3 mg/L 8.7 mg/L	9.7 mg/L, 213 lbs/day 22 mg/L
Total Recoverable Copper	15 µg/L	21 µg/L
Total Recoverable Mercury	0.18 µg/L	0.26 µg/L
Total Recoverable Zinc	88 µg/L	138 µg/L

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Parameter < 3.43 MGD	Average Monthly	Maximum Daily^d
Total Residual Chlorine	0.011 mg/L	0.030 mg/L
Total Ammonia (as NH ₃ -N) (May-Oct) (Nov-Apr)	3.3 mg/L 7.6 mg/L	7.4 mg/L, 213 lbs/day 19 mg/L
Total Recoverable Copper	15 µg/L	20 µg/L
Total Recoverable Mercury	0.14 µg/L	0.20 µg/L
Total Recoverable Zinc	84 µg/L	132 µg/L

Water quality criteria for metals in Chapter 173-201A WAC are based on the dissolved fraction of the metal.

The Permittee may provide data clearly demonstrating the seasonal partitioning of the dissolved metal in the ambient water in relation to an effluent discharge. Metals criteria may be adjusted on a site-specific basis when data is available clearly demonstrating the seasonal partitioning in the ambient water in relation to an effluent discharge.

Metals criteria may also be adjusted using the water effects ratio approach established by USEPA, as generally guided by the procedures in USEPA Water Quality Standards Handbook, December 1983, as supplemented or replaced.

WHOLE EFFLUENT TOXICITY

The Water Quality Standards for Surface Waters require that the effluent not cause toxic effects in the receiving waters. Many toxic pollutants cannot be detected by commonly available detection methods. However, toxicity can be measured directly by exposing living organisms to the wastewater in laboratory tests and measuring the response of the organisms. Toxicity tests measure the aggregate toxicity of the whole effluent, and therefore this approach is called whole effluent toxicity (WET) testing.

Toxicity testing during the previous permit term showed no toxicity present in the effluent. Therefore, no whole effluent toxicity testing is required in this permit. The Department may require effluent toxicity testing in the future if it receives information that toxicity may be present in this effluent.

HUMAN HEALTH

Washington's water quality standards now include 91 numeric health-based criteria that must be considered in NPDES permits. These criteria were promulgated for the state by the U.S. EPA in its National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992).

The Department has determined that the applicant's discharge is unlikely to contain chemicals regulated for human health. The discharge will be re-evaluated for impacts to human health at the next permit reissuance.

SEDIMENT QUALITY

The Department has promulgated aquatic sediment standards (Chapter 173-204 WAC) to protect aquatic biota and human health. These standards state that the Department may require Permittees to evaluate the potential for the discharge to cause a violation of applicable standards (WAC 173-204-400).

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The Department has been unable to determine at this time the potential for this discharge to cause a violation of sediment quality standards. If the Department determines in the future that there is a potential for violation of the Sediment Quality Standards, an order will be issued to require the Permittee to demonstrate that either the point of discharge is not an area of deposition or, if the point of discharge is a depositional area, that there is not an accumulation of toxics in the sediments.

GROUND WATER QUALITY LIMITATIONS

The Department has promulgated Ground Water Quality Standards (Chapter 173-200 WAC) to protect uses of ground water. Permits issued by the Department shall be conditioned in such a manner so as not to allow violations of those standards (WAC 173-200-100).

This Permittee has no discharge to ground and therefore no limitations are required based on potential effects to ground water.

COMPARISON OF EFFLUENT LIMITS WITH THE EXISTING PERMIT ISSUED SEPTEMBER 29, 1992.

Flow below 2.62 MGD	Existing Limits		Proposed Limits	
	Monthly Avg.	Weekly Avg.	Monthly Avg.	Weekly Avg.
PARAMETRS	Monthly Avg.	Weekly Avg.	Monthly Avg.	Weekly Avg.
Fecal Coliform	200/100 mL	400/100 mL	100/100 mL	200/100 mL
PARAMETRS	Monthly Avg.	Daily Max.	Monthly Avg.	Daily Max.
Chlorine	0.018 mg/L	0.048 mg/L	0.013 mg/L	0.033 mg/L
May-Oct Ammonia -N	4.5 mg/L	10.5 mg/L 213 lbs/day	4.3 mg/L	9.7 mg/L 213 lbs/day
Nov-Apr Ammonia -N	7.0 mg/L	20.5 mg/L	8.7 mg/L	22 mg/L
Copper	16 µg/L	24 µg/L	15 µg/L	21 µg/L
Mercury	0.4 µg/L	---	0.18 µg/L	0.26 µg/L
Zinc	---	---	88 µg/L	138 µg/L

Flow greater than 2.62 MGD	Existing Limits		Proposed Limits	
PARAMETRS	Monthly Avg.	Weekly Avg.	Monthly Avg.	Weekly Avg.
Fecal Coliform	200/100 mL	400/100 mL	100/100 mL	200/100 mL
PARAMETRS	Monthly Avg.	Daily Max.	Monthly Avg.	Daily Max.
Chlorine	0.015 mg/L	0.040 mg/L	0.011 mg/L	0.030 mg/L
May-Oct Ammonia -N	3.6 mg/L	8.5 mg/L 213 lbs/day	3.3 mg/L	7.4 mg/L 213 lbs/day
Nov-Apr Ammonia -N	5.8 mg/L	17.6 mg/L	7.6 mg/L	19 mg/L
Copper	14 µg/L	20 µg/L	15 µg/L	20 µg/L
Mercury	0.3 µg/L	---	0.14 µg/L	0.20 µg/L
Zinc	---	---	84 µg/L	132 µg/L

MONITORING REQUIREMENTS

Monitoring, recording, and reporting are required (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and the effluent limitations are being achieved.

Monitoring of sludge quantity and quality is necessary to determine the appropriate uses of the sludge. Sludge monitoring is required by the current state and local solid waste management program and also by EPA under 40 CFR 503.

EFFLUENT LIMITS BELOW QUANTITATION

The water quality-based effluent limit for Mercury in the wastewater is below the capability of current analytical technology to quantify. The Quantitation Level is the level at which concentrations can be reliably reported with a specified level of error. For maximum daily effluent limits, if the measured effluent concentration is below the Quantitation Level, the Permittee reports NQ for non-quantifiable. For average monthly effluent limits, all effluent concentrations below the Quantitation Level but above the Method Detection Level are used as reported for calculating the average monthly value.

EFFLUENT LIMITS BELOW DETECTION

The water quality-based effluent limit for Mercury in the wastewater is below the capability of current analytical technology to detect. The Method Detection Level (MDL) is the minimum concentration of an analyte that can be measured and reported with a 99 percent confidence that it's concentration is greater than zero as determined by a specific laboratory method. For maximum daily limits, if the concentrations are below the MDL the Permittee reports ND for non-detectable. For average monthly limits, all values above the MDL are used as reported and all values below the MDL are calculated as zero.

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LAB ACCREDITATION

With the exception of certain parameters the permit requires all monitoring data to be prepared by a laboratory registered or accredited under the provisions of Chapter 173-50 WAC, *Accreditation of Environmental Laboratories*.

OTHER PERMIT CONDITIONS

REPORTING AND RECORDKEEPING

The conditions of S3. are based on the authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 173-220-210).

PREVENTION OF FACILITY OVERLOADING

Overloading of the treatment plant is a violation of the terms and conditions of the permit. To prevent this from occurring, RCW 90.48.110 and WAC 173-220-150 require the Permittee to take the actions detailed in proposed permit requirement S.4. to plan expansions or modifications before existing capacity is reached and to report and correct conditions that could result in new or increased discharges of pollutants. Condition S.4. restricts the amount of flow.

OPERATION AND MAINTENANCE (O&M)

The proposed permit contains condition S.5. as authorized under RCW 90.48.110, WAC 173-220-150, Chapter 173-230 WAC, and WAC 173-240-080. It is included to ensure proper operation and regular maintenance of equipment, and to ensure that adequate safeguards are taken so that constructed facilities are used to their optimum potential in terms of pollutant capture and treatment.

RESIDUAL SOLIDS HANDLING

To prevent water quality problems the Permittee is required in permit condition S7. to store and handle all residual solids (grit, screenings, scum, sludge, and other solid waste) in accordance with the requirements of RCW 90.48.080 and State Water Quality Standards.

The final use and disposal of sewage sludge from this facility is regulated by U.S. EPA under 40 CFR 503. The disposal of other solid waste is under the jurisdiction of the Pierce County Health Department.

PRETREATMENT

Federal and State Pretreatment Program Requirements

Under the terms of the addendum to the "Memorandum of Understanding between Washington Department of Ecology and the United States Environmental Protection Agency, Region 10" (1986), the Department of Ecology (Department) has been delegated authority to administer the Pretreatment Program (i.e. act as the Approval Authority for oversight of delegated Publicly Owned Treatment Works (POTWs)). Under this delegation of authority, the Department has exercised the option of issuing wastewater discharge permits for significant industrial users discharging to POTWs which have not been delegated authority to issue wastewater discharge permits.

There are a number of functions required by the Pretreatment Program which the Department is delegating to such POTWs because they are in a better position to implement the requirements (e.g. tracking the number and general nature of industrial dischargers to the sewerage system). The requirements for a Pretreatment Program are contained in Title 40, part 403 of the Code of Federal

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Regulations. Under the requirements of the Pretreatment Program (40 CFR 403.8(f)(1)(iii)), the Department is required to approve, condition, or deny new discharges or a significant increase in the discharge for existing significant industrial users (SIUs) (40 CFR 403.8 (f)(1)(i)).

The Department is responsible for issuing State Waste Discharge Permits to SIUs and other industrial users of the Permittee's sewer system. Industrial dischargers must obtain these permits from the Department prior to the Permittee accepting the discharge (WAC 173-216-110(5)) (Industries discharging wastewater that is similar in character to domestic wastewater are not required to obtain a permit. Such dischargers should contact the Department to determine if a permit is required.). Industrial dischargers need to apply for a State Waste Discharge Permit sixty days prior to commencing discharge. The conditions contained in the permits will include any applicable conditions for categorical discharges, loading limitations included in contracts with the POTW, and other conditions necessary to assure compliance with State water quality standards and biosolids standards.

The Department requires this POTW to fulfill some of the functions required for the Pretreatment Program in the NPDES permit (e.g. tracking the number and general nature of industrial dischargers to the sewage system). The POTW's NPDES permit will require that all SIUs currently discharging to the POTW be identified and notified of the requirement to apply for a wastewater discharge permit from the Department. None of the obligations imposed on the POTW relieve an industrial or commercial discharger of its primary responsibility for obtaining a wastewater discharge permit (if required), including submittal of engineering reports prior to construction or modification of facilities (40 CFR 403.12(j) and WAC 173-216-070 and WAC 173-240-110, et seq.).

Wastewater Permit Required

RCW 90.48 and WAC 173-216-040 require SIUs to obtain a permit prior to discharge of industrial waste to the Permittee's sewerage system. This provision prohibits the POTW from accepting industrial wastewater from any such dischargers without authorization from the Department.

Requirements for Routine Identification and Reporting of Industrial Users

The NPDES permit requires non-delegated POTWs to "take continuous, routine measures to identify all existing, new, and proposed SIUs and potential significant industrial users (PSIUs) discharging to the Permittee's sewerage system". Examples of such routine measures include regular review of business tax licenses for existing businesses and review of water billing records and existing connection authorization records. System maintenance personnel can also be diligent during performance of their jobs in identifying and reporting as-yet unidentified industrial dischargers. Local newspapers, telephone directories, and word-of-mouth can also be important sources of information regarding new or existing discharges. The POTW is required to notify an industrial discharger, in writing, of their responsibilities regarding application for a State waste discharge permit and to send a copy of the written notification to the Department. The Department will then take steps to solicit a State waste discharge permit application.

Requirements for Performing an Industrial User Survey

This POTW has the potential to serve significant industrial or commercial users and is required to perform an Industrial User Survey. The goal of this survey is to develop a list of SIUs and PSIUs, and of equal importance, to provide sufficient information about industries which discharge to the POTW, to determine which of them require issuance of State waste discharge permits or other regulatory controls. An Industrial User Survey is an important part of the regulatory process used to prevent interference with treatment processes at the POTW and to prevent the exceedance of water quality standards. The Industrial User Survey also can be used to contribute to the maintenance of sludge quality, so that sludge can be a useful biosolids product rather than an expensive waste problem. An Industrial User Survey is a

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rigorous method for identifying existing, new, and proposed significant industrial users and potential significant industrial users. A complete listing of methodologies is available in the Department of Ecology guidance document entitled "Conducting an Industrial User Survey".

Annual Submittal of List of Industrial Users

This provision requires the POTW to submit annually a list of existing and proposed SIUs and PSIUs. This requirement is intended to update the Department on an annual basis of the status of industrial users in the POTW's service area, without requiring the POTW to go through the process of performing a formal Industrial User Survey. This provision is normally applied to POTWs not serving industrial or commercial users. Although this permit does not require performance of an Industrial User Survey, the Permittee is nevertheless required under the previous section, to take adequate continuous routine measures to identify existing and new industrial discharges.

Duty to Enforce Discharge Prohibitions

This provision prohibits the POTW from authorizing or permitting an industrial discharger to discharge certain types of waste into the sanitary sewer. The first portion of the provision prohibits acceptance of pollutants which cause pass through or interference. The definitions of pass through and interference are in Appendix B of the fact sheet.

The second portion of this provision prohibits the POTW from accepting certain specific types of wastes, namely those which are explosive, flammable, excessively acidic, basic, otherwise corrosive, or obstructive to the system. In addition wastes with excessive BOD, petroleum-based oils, or which result in toxic gases are prohibited to be discharged. The regulatory basis for these prohibitions is 40 CFR Part 403, with the exception of the pH provisions which are based on WAC 173-216-060.

The third portion of this provision prohibits certain types of discharges unless the POTW receives prior authorization from the Department. The discharges include cooling water in significant volumes, stormwater and other direct inflow sources, and wastewaters significantly affecting system hydraulic loading, which do not require treatment.

Support by the Department for Developing Partial Pretreatment Program by POTW

The Department has committed to providing technical and legal assistance to the Permittee in fulfilling these joint obligations, in particular assistance with developing an adequate sewer use ordinance, notification procedures, enforcement guidelines, and developing local limits and inspection procedures.

RECEIVING WATER STUDY

Proposed permit condition S9 requires a receiving water study to gather information to determine if the effluent has a reasonable potential to cause a violation of the water quality standards.

Total and Dissolved Metals – The receiving water near the outfall will be sampled for both total and dissolved metals as well as hardness to determine if there is a potential to violate water quality standards for metals and to develop translator values for the total recoverable to dissolved fraction of metals.

Dissolved Oxygen - The receiving water near the outfall will be sampled for BOD₅, Total Kjeldahl Nitrogen (TKN), dissolved oxygen, and temperature to determine if there is the potential for a violation of dissolved oxygen standard.

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Ammonia - The receiving water near the outfall shall also be sampled for total ammonia, pH and temperature to determine the potential for the effluent to cause a violation of the water quality standards for total ammonia.

pH - Alkalinity will be tested to determine whether the water quality or technology based standard for pH should apply to the discharge.

OUTFALL EVALUATION

Proposed permit condition S11 requires the Permittee to conduct an outfall inspection and submit a report detailing the findings of that inspection. The purpose of the inspection is to determine the condition of the discharge pipe and diffusers and to determine if sediment is accumulating in the vicinity of the outfall.

GENERAL CONDITIONS

General Conditions are based directly on state and federal law and regulations and have been standardized for all individual municipal NPDES permits issued by the Department.

PERMIT ISSUANCE PROCEDURES

PERMIT MODIFICATIONS

The Department may modify this permit to impose numerical limitations, if necessary to meet Water Quality Standards, Sediment Quality Standards, or Ground Water Standards, based on new information obtained from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

The Department may also modify this permit as a result of new or amended state or federal regulations.

RECOMMENDATION FOR PERMIT ISSUANCE

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to protect human health, aquatic life, and the beneficial uses of waters of the State of Washington. The Department proposes that this permit be issued for five years.

REFERENCES FOR TEXT AND APPENDICES

Environmental Protection Agency (EPA)

1992. National Toxics Rule. Federal Register, V. 57, No. 246, Tuesday, December 22, 1992.
1991. Technical Support Document for Water Quality-based Toxics Control. EPA/505/2-90-001.
1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington, D.C.
1985. Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water. EPA/600/6-85/002a.
1983. Water Quality Standards Handbook. USEPA Office of Water, Washington, D.C.

Metcalf and Eddy.

1991. Wastewater Engineering, Treatment, Disposal, and Reuse. Third Edition.

Tsivoglou, E.C., and J.R. Wallace.

1972. Characterization of Stream Reaeration Capacity. EPA-R3-72-012. (Cited in EPA 1985 op.cit.)

Washington State Department of Ecology.

1994. Permit Writer's Manual. Publication Number 92-109

Water Pollution Control Federation.

1976. Chlorination of Wastewater.

Wright, R.M., and A.J. McDonnell.

1979. In-stream Deoxygenation Rate Prediction. Journal Environmental Engineering Division, ASCE. 105(E2). (Cited in EPA 1985 op.cit.)

APPENDIX A--PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to reissue a permit to the applicant listed on page 1 of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

Public notice of application was published on October 8, 2000, and October 15, 2000, in *Tacoma News Tribune* to inform the public that an application had been submitted and to invite comment on the reissuance of this permit.

The Department published a Public Notice of Draft (PNOD) on March 9, 2001, in *Tacoma News Tribune* to inform the public that a draft permit and fact sheet are available for review. Interested persons are invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents are available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments should be mailed to:

Water Quality Permit Coordinator
Department of Ecology
Southwest Regional Office
PO Box 47775
Olympia, WA 98504-7775

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the thirty (30) day comment period to the address above. The request for a hearing shall indicate the interest of the party and the reasons why the hearing is warranted. The Department will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-220-090). Public notice regarding any hearing will be circulated at least thirty (30) days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing (WAC 173-220-100).

Comments should reference specific text followed by proposed modification or concern when possible. Comments may address technical issues, accuracy and completeness of information, the scope of the facility's proposed coverage, adequacy of environmental protection, permit conditions, or any other concern that would result from issuance of this permit.

The Department will consider all comments received within thirty (30) days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by telephone, (360) 407-6279, or by writing to the address listed above.

This permit and fact sheet were written by Glenn Pieritz.

APPENDIX B--GLOSSARY

Acute Toxicity--The lethal effect of a pollutant on an organism that occurs within a short period of time, usually 48 to 96 hours.

AKART-- An acronym for "all known, available, and reasonable methods of prevention, control, and treatment".

Ambient Water Quality--The existing environmental condition of the water in a receiving water body.

Ammonia--Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

Average Monthly Discharge Limitation --The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month (except in the case of fecal coliform). The daily discharge is calculated as the average measurement of the pollutant over the day.

Average Weekly Discharge Limitation -- The highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week. The daily discharge is calculated as the average measurement of the pollutant over the day.

Best Management Practices (BMPs)--Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD₅--Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD₅ is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass--The intentional diversion of waste streams from any portion of a treatment facility.

Chlorine--Chlorine is used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

Chronic Toxicity--The effect of a pollutant on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

Clean Water Act (CWA)--The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

Combined Sewer Overflow (CSO)--The event during which excess combined sewage flow caused by inflow is discharged from a combined sewer, rather than conveyed to the sewage treatment plant because either the capacity of the treatment plant or the combined sewer is exceeded.

Compliance Inspection - Without Sampling--A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

Compliance Inspection - With Sampling--A site visit to accomplish the purpose of a Compliance Inspection - Without Sampling and as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the percent removal requirement. Additional sampling may be conducted.

Composite Sample--A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing a minimum of four discrete samples. May be "time-composite"(collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots.

Construction Activity--Clearing, grading, excavation and any other activity which disturbs the surface of the land. Such activities may include road building, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

Continuous Monitoring --Uninterrupted, unless otherwise noted in the permit.

Critical Condition--The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

Dilution Factor--A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the effluent fraction e.g., a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water 90%.

Engineering Report--A document which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Fecal Coliform Bacteria--Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

Grab Sample--A single sample or measurement taken at a specific time or over as short period of time as is feasible.

Industrial User-- A discharger of wastewater to the sanitary sewer which is not sanitary wastewater or is not equivalent to sanitary wastewater in character.

Industrial Wastewater--Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

Infiltration and Inflow (I/I)--"Infiltration" means the addition of ground water into a sewer through joints, the sewer pipe material, cracks, and other defects. "Inflow" means the addition of precipitation-caused drainage from roof drains, yard drains, basement drains, street catch basins, etc., into a sewer.

Interference -- A discharge which, alone or in conjunction with a discharge or discharges from other sources, both:

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Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal and;

Therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to subtitle D of the SWDA), sludge regulations appearing in 40 CFR Part 507, the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act.

Major Facility--A facility discharging to surface water with an EPA rating score of > 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Maximum Daily Discharge Limitation--The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Method Detection Level (MDL)--The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is above zero and is determined from analysis of a sample in a given matrix containing the analyte.

Minor Facility--A facility discharging to surface water with an EPA rating score of < 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Mixing Zone--A volume that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in State regulations (Chapter 173-201A WAC).

National Pollutant Discharge Elimination System (NPDES)--The NPDES (Section 402 of the Clean Water Act) is the Federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the State of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both State and Federal laws.

Pass through -- A discharge which exits the POTW into waters of the--State in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation), or which is a cause of a violation of State water quality standards.

pH--The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

Potential Significant Industrial User--A potential significant industrial user is defined as an Industrial User which does not meet the criteria for a Significant Industrial User, but which discharges wastewater meeting one or more of the following criteria:

- a. Exceeds 0.5 % of treatment plant design capacity criteria and discharges <25,000 gallons per day or;
- b. Is a member of a group of similar industrial users which, taken together, have the potential to cause pass through or interference at the POTW (e.g. facilities which develop photographic film or paper, and car washes).

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The Department may determine that a discharger initially classified as a potential significant industrial user should be managed as a significant industrial user.

Quantitation Level (QL)-- A calculated value five times the MDL (method detection level).

Significant Industrial User (SIU)--

- 1) All industrial users subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N and;
- 2) Any other industrial user that: discharges an average of 25,000 gallons per day or more of process wastewater to the POTW (excluding sanitary, noncontact cooling, and boiler blow-down wastewater); contributes a process wastestream that makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the Control Authority* on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement (in accordance with 40 CFR 403.8(f)(6)).

Upon finding that the industrial user meeting the criteria in paragraph 2, above, has no reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement, the Control Authority* may at any time, on its own initiative or in response to a petition received from an industrial user or POTW, and in accordance with 40 CFR 403.8(f)(6), determine that such industrial user is not a significant industrial user.

*The term "Control Authority" refers to the Washington State Department of Ecology in the case of non-delegated POTWs or to the POTW in the case of delegated POTWs.

State Waters--Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, wetlands, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Stormwater--That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

Technology-based Effluent Limit--A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Suspended Solids (TSS)--Total suspended solids are the particulate materials in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

Upset--An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

Water Quality-based Effluent Limit--A limit on the concentration or mass of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water.

APPENDIX C--TECHNICAL CALCULATIONS

Effluent Flows

Daily maximum and monthly average flows were estimated from design criteria and historical peaking factors developed from daily flow data received from wastewater treatment plant staff. For 7Q10 ambient flows, the effluent values used correspond to maximum effluent flows predicted to occur simultaneously with the 7Q10 condition. For seasonal 7Q20 flows, the effluent values correspond to the seasonal 7Q20 ambient conditions.

City of Sumner WWTF Plant Flows 1993 - 1999			
	Existing	Estimated	Estimated
	Flows	Using Peaking Factors	Using Peaking Factors
		< 2.62 MGD	< 3.43 MGD
Average Annual Flow (AAF) MGD =	1.48	1.54	2.02
Average Annual Dry Weather Flow (ADWF) MGD =	1.28	1.34	1.75
Average Annual Wet Weather Flow (AWWF) MGD =	1.68	1.75	2.30
Peak Month Flow (PMF) MGD =	2.51	2.62	3.43
Peak Day Flow (PDF) MGD =	4.09	4.27	5.59
Dry Weather Peak Month Flow (DW-PMF) =	1.52	1.59	2.08
Wet Weather Peak Month Flow (WW-PMF) =	2.51	2.62	3.43
Dry Weather Peak Day Flow (DW-PDF) =	1.82	1.90	2.48
Wet Weather Peak Day Flow (WW-PDF) =	4.09	4.27	5.59

Estimated flows for establishing permit limits when maximum monthly flows are below the interim design flow of 2.62 MGD.

1. 2.62 MGD = Monthly average design flow, maximum month, used in calculations for wet weather and year round chronic dilution factors.
2. 4.27 MGD = Maximum daily flow, used in calculations for wet weather and year round acute dilution factors.
3. 1.59 MGD = Monthly average dry weather flow, maximum month, used in calculations for dry weather chronic dilution factors.
4. 1.9 MGD = Maximum daily dry weather flow, used in calculations for dry weather acute dilution factors.

Estimated flows for establishing permit limits when maximum monthly flows are below the final design flow of 3.43 MGD.

1. 3.43 MGD = Monthly average design flow, maximum month, used in calculations for wet weather and year round chronic dilution factors.
2. 5.59 MGD = Maximum daily flow, used in calculations for wet weather and year round acute dilution factors.

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3. 2.08 MGD = Monthly average dry weather flow, maximum month, used in calculations for dry weather chronic dilution factors.
4. 2.48 MGD = Maximum daily dry weather flow, used in calculations for dry weather acute dilution factors.

Calculation of Dilution Factors

Dilution factors were based on percent of flow allowable criteria under WAC 173-201A-100(7).

- a. Chronic = (Effluent flow + 0.25 x Ambient Flow)/Effluent Flow
- b. Acute = (Effluent flow + 0.025 x Ambient Flow)/Effluent Flow

	Annual 7Q10 Flows		Summer 7Q20 Flows		Winter 7Q20 Flows	
	7Q10 = 199 cfs		7Q20 = 168 cfs		7Q20 = 320 cfs	
	Acute	Chronic	Acute	Chronic	Acute	Chronic
Flows \leq 2.62 MGD	1.8	13.3	2.4	18.1	2.2	20.7
Flows \leq 3.43 MGD	1.6	10.4	2.1	14.0	1.9	16.1

Load Limits for BOD₅ and Ammonia as N

Due to the potential for dissolved oxygen problems in the lower Puyallup River, the Department of Ecology established a seasonal TMDL for ammonia and biochemical oxygen demand (BOD) throughout the Puyallup River basin and tributaries effective May 1, through October 31. The wasteload allocations (WLAs) established for the Sumner Wastewater Treatment Plant discharge are 1,284 pounds per day of BOD₅ and 213 pound per day of Ammonia as N.

BOD₅

Load limits for BOD₅ were calculated based on flow (2.62 MGD & 3.43 MGD) x the conversion factor of 8.34 x the monthly average and average weekly technology concentration limits (30/45 mg/L). The weekly average load limit of 1,284 set by the Puyallup TMDL is reached when the final design flow of 3.43 MGD is applicable.

AMMONIA AS N

The daily maximum mass limit of 213 lbs/day set by the Puyallup TMDL applies from May 1, through October 31. The corresponding daily max concentration limit is calculated as follows: (213 lbs/day)/(2.62 MGD x 8.34) = 9.7 mg/L and (213 lbs/day)/(3.43 MGD x 8.34) = 7.4 mg/L.

The monthly average limit for May 1 through October 31 is calculated by determining the long term average from the daily maximum limit and then calculating the corresponding monthly average limit using the LTA as follows:

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Maximum Daily Limit MDL =	9.7	7.4
Coefficient of Variation for Effluent Concentration (CV) =	0.6	0.6
$\sigma^2 = \ln[CV^2+1] =$	0.307	0.307
$\sigma =$	0.555	0.555
z = 99th percentile occurrence	2.326	2.326
$e^{(z \sigma - 0.5 \sigma^2)} =$	3.115	3.115
Smallest LTA of LTA _a , LTA _c =	3.114	2.390
n; number of samples per month =	8	8
$\sigma_n^2 = \ln[CV^2/n+1] =$	0.044	0.044
$\sigma_n =$	0.210	0.210
z = 95th percentile occurrence	1.645	1.645
$e^{(z \sigma_n - 0.5 \sigma_n^2)} =$	1.381	1.381
Average Monthly Limit AML =	4.3	3.3

**Determining the Requirement for Permit Limits Through a
Reasonable Potential Determination to Violate Standards at
the Edge of the Mixing Zone.
Based on EPA/505/2-90-001**

Notes: City of Sumner Chlorine Residual - Design Flow < 2.62 MGD

INPUT	
Confidence Level and Probability Basis:	0.95
Coefficient of Variation for the Effluent Concentration (CV) (0.6 or a calculated CV if there are more than 10 data points):	0.6
Number of Effluent Samples or Data Points (ND):	97
Highest Effluent Concentration or Value (HV):	0.8
Dilution Factors (1/{Effluent Volume Fraction}) or plumes model	
Acute Receiving Water Dilution Factor:	1.75
Chronic Receiving Water Dilution Factor:	13.27
Water Quality Standards (Concentration)	
Acute (one-hour) Criteria:	0.019
Chronic (n-day) Criteria:	0.011
Upstream Receiving Water Concentration:	
Upstream Concentration for Acute Condition (7Q10): 95th%-tile	0
Upstream Concentration for Chronic Condition (7Q10): 90th%-tile	0
MECB: 1-9 data points, highest value by 2; 10-50 the highest value; >50 calculate 90th %-tile	
OUTPUT	
Percentile Represented by the Highest Concentration in Data Set $(p_n) = (1 - \text{confidence level})^{1/ND}$	0.969588196
Normal Distribution Value for 95th Percentile	1.644853
Normal Distribution Value for 97th Percentile	1.874777809
$\sigma^2 = \ln(CV^2 + 1)$	0.3074847
$C95 = \exp(1.645\sigma - 0.5\sigma^2)$	2.134751124
$C97 = \exp(1.875\sigma - 0.5\sigma^2)$	2.425036006
Reasonable Potential Multiplier = $C95/C97$	0.9
Maximum Expected Concentration of Pollutant in Effluent (MEC):	0.704237337
Acute - Concentration of Pollutant at the Edge of the Mixing Zone (CP):	0.401689031
Chronic - Concentration of Pollutant at the Edge of the Mixing Zone (CP):	0.053062813
Reasonable Potential to Violate Acute Criteria at the Edge of the Mixing Zone (RP):	YES
Reasonable Potential to Violate Chronic Criteria at the Edge of the Mixing Zone (RP):	YES

**Water Quality-Based Permit Limits for Acute and Chronic Criteria.
(based on EPA/505/2-90-001 Box 5-2).**

Based on Lotus File WQBP2.WK1 Revised 19-Oct-93

Notes: City of Sumner Chlorine Residual - Design Flow < 2.62 MGD

INPUT	
1. Water Quality Standards (Concentration)	
Acute (one-hour) Criteria:	0.019
Chronic (n-day) Criteria:	0.011
2. Upstream Receiving Water Concentration	
Upstream Concentration for Acute Condition (7Q10): 95th%-tile	0.000
Upstream Concentration for Chronic Condition (7Q10): 90th%-tile	0.000
3. Dilution Factors ($1/\{\text{Effluent Volume Fraction}\}$) or Plumes Model	
Acute Receiving Water Dilution Factor:	1.75
Chronic Receiving Water Dilution Factor:	13.27
4. Coefficient of Variation for Effluent Concentration (0.6 or a calculated CV if there are more than 10 data points):	0.600
5. Number of days (n1) for chronic average (usually four or seven; four is recommended):	4
6. Number of samples (n2) required per month for monitoring:	30
OUTPUT	
1. Z Statistics	
LTA Derivation (99%tile):	2.326
Daily Maximum Permit Limit (99%tile):	2.326
Monthly Average Permit Limit (95%tile):	1.645
2. Calculated Waste Load Allocations (WLA's)	
Acute (one-hour) WLA:	0.033
Chronic (n1-day) WLA:	0.146
3. Derivation of LTAs using April 1990 TSD (Box 5-2 Step 2 & 3)	
Sigma ² :	0.3075
Sigma ² -n1:	0.0862
LTA for Acute (1-hour) WLA:	0.011
LTA for Chronic (n1-day) WLA:	0.077
Most Limiting LTA (minimum of acute and chronic):	0.011
4. Derivation of Permit Limits From Limiting LTA (Box 5-2 Step 4)	
Sigma ² -n2:	0.0119
Daily Maximum Permit Limit:	0.033
Monthly Average Permit Limit:	0.013

**Determining the Requirement for Permit Limits Through a
Reasonable Potential Determination to Violate Standards at
the Edge of the Mixing Zone.
Based on EPA/505/2-90-001**

Notes: City of Sumner Chlorine Residual - Design Flow < 3.43 MGD

INPUT	
Confidence Level and Probability Basis:	0.95
Coefficient of Variation for the Effluent Concentration (CV) (0.6 or a calculated CV if there are more than 10 data points):	0.6
Number of Effluent Samples or Data Points (ND):	97
Highest Effluent Concentration or Value (HV):	0.8
Dilution Factors (1/{Effluent Volume Fraction}) or plumes model	
Acute Receiving Water Dilution Factor:	1.58
Chronic Receiving Water Dilution Factor:	10.37
Water Quality Standards (Concentration)	
Acute (one-hour) Criteria:	0.019
Chronic (n-day) Criteria:	0.011
Upstream Receiving Water Concentration:	
Upstream Concentration for Acute Condition (7Q10): 95th%-tile	0
Upstream Concentration for Chronic Condition (7Q10): 90th%-tile	0
MECB: 1-9 data points, highest value by 2; 10-50 the highest value; >50 calculate 90th %-tile	
OUTPUT	
Percentile Represented by the Highest Concentration in Data Set ($p_n = (1 - \text{confidence level})^{1/ND}$)	0.969588196
Normal Distribution Value for 95th Percentile	1.644853
Normal Distribution Value for 97th Percentile	1.874777809
$\sigma^2 = \ln(CV^2 + 1)$	0.3074847
$C95 = \exp(1.645\sigma - 0.5\sigma^2)$	2.134751124
$C97 = \exp(1.875\sigma - 0.5\sigma^2)$	2.425036006
Reasonable Potential Multiplier = $C95/C97$	0.9
Maximum Expected Concentration of Pollutant in Effluent (MEC):	0.704237337
Acute - Concentration of Pollutant at the Edge of the Mixing Zone (CP):	0.447043068
Chronic - Concentration of Pollutant at the Edge of the Mixing Zone (CP):	0.067886344
Reasonable Potential to Violate Acute Criteria at the Edge of the Mixing Zone:	YES
Reasonable Potential to Violate Chronic Criteria at the Edge of the Mixing Zone:	YES

**Water Quality-Based Permit Limits for Acute and Chronic Criteria.
(based on EPA/505/2-90-001 Box 5-2).**

Based on Lotus File WQBP2.WK1 Revised 19-Oct-93

Notes: City of Sumner Chlorine Residual - Design Flow < 3.43 MGD

INPUT	
1. Water Quality Standards (Concentration)	
Acute (one-hour) Criteria:	0.019
Chronic (n-day) Criteria:	0.011
2. Upstream Receiving Water Concentration	
Upstream Concentration for Acute Condition (7Q10): 95th%-tile	0.000
Upstream Concentration for Chronic Condition (7Q10): 90th%-tile	0.000
3. Dilution Factors ($1/\{\text{Effluent Volume Fraction}\}$) or Plumes Model	
Acute Receiving Water Dilution Factor:	1.58
Chronic Receiving Water Dilution Factor:	10.37
4. Coefficient of Variation for Effluent Concentration (0.6 or a calculated CV if there are more than 10 data points):	0.600
5. Number of days (n1) for chronic average (usually four or seven; four is recommended):	4
6. Number of samples (n2) required per month for monitoring:	30
OUTPUT	
1. Z Statistics	
LTA Derivation (99%tile):	2.326
Daily Maximum Permit Limit (99%tile):	2.326
Monthly Average Permit Limit (95%tile):	1.645
2. Calculated Waste Load Allocations (WLA's)	
Acute (one-hour) WLA:	0.030
Chronic (n1-day) WLA:	0.114
3. Derivation of LTAs using April 1990 TSD (Box 5-2 Step 2 & 3)	
Sigma^2 :	0.3075
$\text{Sigma}^2\text{-n1}$:	0.0862
LTA for Acute (1-hour) WLA:	0.010
LTA for Chronic (n1-day) WLA:	0.060
Most Limiting LTA (minimum of acute and chronic):	0.010
4. Derivation of Permit Limits From Limiting LTA (Box 5-2 Step 4)	
$\text{Sigma}^2\text{-n2}$:	0.0119
Daily Maximum Permit Limit:	0.030
Monthly Average Permit Limit:	0.011

**Determining the Requirement for Permit Limits Through a
Reasonable Potential Determination to Violate Standards at
the Edge of the Mixing Zone.
Based on EPA/505/2-90-001**

Notes: City of Sumner NH₃-N Determination Design Flow < 2.62 MGD

INPUT		
Confidence Level and Probability Basis:	May to Oct. 0.95	Nov. to Apr. 0.95
Coefficient of Variation for the Effluent Concentration (CV) (0.6 or a calculated CV if there are more than 10 data points):	0.79	0.74
Number of Effluent Samples or Data Points (ND):	8	8
Highest Effluent Concentration or Value (HV):	8.02	4.33
Dilution Factors (1/{Effluent Volume Fraction}) or plumes model		
Acute Receiving Water Dilution Factor:	2.43	2.21
Chronic Receiving Water Dilution Factor:	18.08	20.73
Water Quality Standards (Concentration)		
Acute (one-hour) Criteria:	10.63	10.07
Chronic (n-day) Criteria:	1.80	2.20
Upstream Receiving Water Concentration:		
Upstream Concentration for Acute Condition (7Q10):	0.103	0.14
Upstream Concentration for Chronic Condition (7Q10):	0.066	0.1
MECB: 1-9 data points, highest value by 2; 10-50 the highest value; >50 calculate 90th %-tile		
OUTPUT		
Percentile Represented by the Highest Concentration in Data Set (p _n) = (1 - confidence level) ^{1/ND}	0.687656022	0.687656022
Normal Distribution Value for 95th Percentile	1.644853	1.644853
Normal Distribution Value for 69th Percentile	0.4892172	0.4892172
□ ² = ln(CV ² +1)	0.484953816	0.436705344
C95 = exp(1.645Sigma -0.5Sigma ²)	2.466934071	2.38363541
C69 = exp(0.489Sigma -0.5Sigma ²)	1.103191371	1.110644061
Reasonable Potential Multiplier = C95/C69	2.2	2.1
Maximum Expected Concentration of Pollutant in Effluent (MEC):	17.93416063	9.292933433
Acute - Concentration of Pollutant at the Edge of the Mixing Zone:	7.439616943	4.279425406
Chronic - Concentration of Pollutant at the Edge of the Mixing Zone:	1.054456905	0.54338559
Potential to Violate Acute Criteria at the Edge of the Mixing Zone:	NO	NO
Potential to Violate Chronic Criteria at the Edge of the Mixing Zone:	NO	NO

**Water Quality-Based Permit Limits for Acute and Chronic Criteria.
(based on EPA/505/2-90-001 Box 5-2).**

Based on Lotus File WQBP2.WK1 Revised 19-Oct-93

Notes: City of Sumner NH₃-N Determination Design Flow < 2.62 MGD

INPUT		
	May to Oct.	Nov. to Apr.
1. Water Quality Standards (Concentration)		
Acute (one-hour) Criteria:	10.631	10.074
Chronic (n-day) Criteria:	1.798	2.196
2. Upstream Receiving Water Concentration		
Upstream Concentration for Acute Condition (7Q10): 95th%-tile	0.103	0.140
Upstream Concentration for Chronic Condition (7Q10): 90th%-tile	0.066	0.100
3. Dilution Factors (1/{Effluent Volume Fraction}) or Plumes Model		
Acute Receiving Water Dilution Factor:	2.43	2.21
Chronic Receiving Water Dilution Factor:	18.08	20.73
4. Coefficient of Variation for Effluent Concentration (0.6 or a calculated CV if there are more than 10 data points):	0.790	0.740
5. Number of days (n1) for chronic average (usually four or seven; four is recommended):	4	4
6. Number of samples (n2) required per month for monitoring:	8	8
OUTPUT		
1. Z Statistics		
LTA Derivation (99%tile):	2.326	2.326
Daily Maximum Permit Limit (99%tile):	2.326	2.326
Monthly Average Permit Limit (95%tile):	1.645	1.645
2. Calculated Waste Load Allocations (WLA's)		
Acute (one-hour) WLA:	25.692	22.105
Chronic (n1-day) WLA:	31.370	43.551
3. Derivation of LTAs using April 1990 TSD (Box 5-2 Step 2 & 3)		
Sigma ² :	0.4850	0.4367
Sigma ² -n1:	0.1450	0.1283
LTA for Acute (1-hour) WLA:	6.479	5.911
LTA for Chronic (n1-day) WLA:	13.909	20.182
Most Limiting LTA (minimum of acute and chronic):	6.479	5.911
4. Derivation of Permit Limits From Limiting LTA (Box 5-2 Step 4)		
Sigma ² -n2:	0.0751	0.0662
Daily Maximum Permit Limit:	25.692	22.105
Monthly Average Permit Limit:	9.795	8.732

**Determining the Requirement for Permit Limits Through a
Reasonable Potential Determination to Violate Standards at
the Edge of the Mixing Zone.
Based on EPA/505/2-90-001**

Notes: City of Sumner NH₃-N Determination Design Flow < 3.43 MGD

INPUT		
	May to Oct.	Nov. to Apr.
Confidence Level and Probability Basis:	0.95	0.95
Coefficient of Variation for the Effluent Concentration (CV) (0.6 or a calculated CV if there are more than 10 data points):	0.79	0.74
Number of Effluent Samples or Data Points (ND):	8	8
Highest Effluent Concentration or Value (HV):	8.02	4.33
Dilution Factors (1/{Effluent Volume Fraction}) or plumes model		
Acute Receiving Water Dilution Factor:	2.09	1.93
Chronic Receiving Water Dilution Factor:	14.04	16.07
Water Quality Standards (Concentration)		
Acute (one-hour) Criteria:	10.63	10.07
Chronic (n-day) Criteria:	1.80	2.20
Upstream Receiving Water Concentration:		
Upstream Concentration for Acute Condition (7Q10):	0.103	0.14
Upstream Concentration for Chronic Condition (7Q10):	0.066	0.1
MECB: 1-9 data points, highest value by 2; 10-50 the highest value; >50 calculate 90th %-tile		
OUTPUT		
Percentile Represented by the Highest Concentration in Data Set (p _n) = (1 - confidence level) ^{1/ND}	0.687656022	0.687656022
Normal Distribution Value for 95th Percentile	1.644853	1.644853
Normal Distribution Value for 69th Percentile	0.4892172	0.4892172
Sigma ² = ln(CV ² +1)	0.484953816	0.436705344
C95 = exp(1.645Sigma -0.5Sigma ²)	2.466934071	2.38363541
C69 = exp(0.489Sigma -0.5Sigma ²)	1.103191371	1.110644061
Reasonable Potential Multiplier = C95/C69	2.2	2.1
Maximum Expected Concentration of Pollutant in Effluent (MEC):	17.93416063	9.292933433
Acute - Concentration of Pollutant at the Edge of the Mixing Zone:	8.623915198	4.89441765
Chronic - Concentration of Pollutant at the Edge of the Mixing Zone:	1.338289118	0.67193461
Potential to Violate Acute Criteria at the Edge of the Mixing Zone:	NO	NO
Potential to Violate Chronic Criteria at the Edge of the Mixing Zone:	NO	NO

**Water Quality-Based Permit Limits for Acute and Chronic Criteria.
(based on EPA/505/2-90-001 Box 5-2).**

Based on Lotus File WQBP2.WK1 Revised 19-Oct-93

Notes: City of Sumner NH₃-N Determination Design Flow < 3.43 MGD

INPUT		
	May to Oct.	Nov. to Apr.
1. Water Quality Standards (Concentration)		
Acute (one-hour) Criteria:	10.631	10.074
Chronic (n-day) Criteria:	1.798	2.196
2. Upstream Receiving Water Concentration		
Upstream Concentration for Acute Condition (7Q10): 95th%-tile	0.103	0.140
Upstream Concentration for Chronic Condition (7Q10): 90th%-tile	0.066	0.100
3. Dilution Factors (1/{Effluent Volume Fraction}) or Plumes Model		
Acute Receiving Water Dilution Factor:	2.09	1.93
Chronic Receiving Water Dilution Factor:	14.04	16.07
4. Coefficient of Variation for Effluent Concentration (0.6 or a calculated CV if there are more than 10 data points):	0.790	0.740
5. Number of days (n1) for chronic average (usually four or seven; four is recommended):	4	4
6. Number of samples (n2) required per month for monitoring:	8	8
OUTPUT		
1. Z Statistics		
LTA Derivation (99%tile):	2.326	2.326
Daily Maximum Permit Limit (99%tile):	2.326	2.326
Monthly Average Permit Limit (95%tile):	1.645	1.645
2. Calculated Waste Load Allocations (WLA's)		
Acute (one-hour) WLA:	22.135	19.264
Chronic (n1-day) WLA:	24.387	33.785
3. Derivation of LTAs using April 1990 TSD (Box 5-2 Step 2 & 3)		
Sigma ² :	0.4850	0.4367
Sigma ² -n1:	0.1450	0.1283
LTA for Acute (1-hour) WLA:	5.582	5.151
LTA for Chronic (n1-day) WLA:	10.813	15.656
Most Limiting LTA (minimum of acute and chronic):	5.582	5.151
4. Derivation of Permit Limits From Limiting LTA (Box 5-2 Step 4)		
Sigma ² -n2:	0.0751	0.0662
Daily Maximum Permit Limit:	22.135	19.264
Monthly Average Permit Limit:	8.439	7.610

FACT SHEET FOR NPDES PERMIT NO. WA0023353
CITY OF SUMNER WASTEWATER TREATMENT FACILITY

Determining the Requirement for Permit Limits Through a Reasonable Potential Determination to Violate Standards at the Edge of the Mixing Zone.

Based on EPA/505/2-90-001

Notes: City of Sumner Metals Determination Design Flow < 2.62
MGD

INPUT											
	Arsenic	Cadmium	Chromium		Copper	Lead	Mercury	Nickel	Selenium	Silver	Zinc
		m	Hex	Tri			y		m		
Confidence Level and Probability Basis:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Coefficient of Variation for the Effluent Concentration (CV)											
(0.6 or a calculated CV if there are more than 10 data points):	0.6	0.6	0.6	0.6	0.48	0.49	0.6	0.6	0.6	0.6	0.75
Number of Effluent Samples or Data Points (ND):	4	4	0	0	68	62	68	0	0	4	62
Highest Effluent Concentration or Value (HV):	1.8	0.14	0	0	23	5	0.5	0	0	0.15	210
Dilution Factors (1/{Effluent Volume Fraction}) or plumes model											
Acute Receiving Water Dilution Factor:	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75
Chronic Receiving Water Dilution Factor:	13.27	13.27	13.27	13.27	13.27	13.27	13.27	13.27	13.27	13.27	13.27
Water Quality Standards (Concentration)											
Acute (one-hour) Criteria:	360	2.406	15.275	1217.81	11.785	47.034	2.471	983.044	20	1.927	79.284
Chronic (n-day) Criteria:	190	0.438	10.395	76.670	4.195	0.680	0.012	56.521	5	---	37.406
Upstream Receiving Water Concentration:											
Upstream Concentration for Acute Condition (7Q10):	1.2	0	0	0	0	0	0	0	0	0	5.1
Upstream Concentration for Chronic Condition (7Q10):	1.2	0	0	0	0	0	0	0	0	0	5.1
MECB: 1-9 data points, multiply highest value by 2; 10-50 use highest value; >50 calculate 90th %-tile											
OUTPUT											

Percentile Represented by the Highest Concentration in Data Set

FACT SHEET FOR NPDES PERMIT NO. WA0023353
CITY OF SUMNER WASTEWATER TREATMENT FACILITY

(p _n) = (1 - confidence level) ^{1/ND}	0.47287	0.47287	---	---	0.95690	0.95283	0.95690	---	---	0.47287	0.95283
	0	0			1	0	1			0	0
Normal Distribution Value for 95th Percentile	1.64485	1.64485	1.64485	1.64485	1.64485	1.64485	1.64485	1.64485	1.64485	1.64485	1.64485
	3	3	3	3	3	3	3	3	3	3	3
Normal Distribution Value for XXth Percentile	-	-	---	---	1.71580	1.67294	1.71580	---	---	-	1.67294
	0.06805	0.06805			7	2	7			0.06805	2
s ² = ln(CV ² +1)	0.30748	0.30748	0.30748	0.30748	0.20733	0.21519	0.30748	0.30748	0.30748	0.30748	0.44628
	4	4	4	4	9	2	4	4	4	4	7
C95 = exp(1.645Sigma -0.5Sigma ²)	2.13475	2.13475	2.13475	2.13475	1.90657	1.92597	2.13475	2.13475	2.13475	2.13475	2.40054
	1	1	1	1	1	3	1	1	1	1	5
CXX = exp(XX Sigma -0.5Sigma ²)	0.82573	0.82573	---	---	1.96917	1.95123	2.22041	---	---	0.82573	2.44601
	6	6			5	3	7			6	7
Reasonable Potential Multiplier = C95/CXX	2.59	2.59	---	---	0.97	0.99	0.96	---	---	2.59	0.98
Maximum Expected Concentration of Pollutant in Effluent (MEC):	4.65348	0.36193	#VALU	#VALU	22.2687	4.93527	0.48070	#VALU	#VALU	0.38779	206.096
	5	7	E	E	7	0	9	E	E	0	0
Acute - Concentration of Pollutant at the Edge of the Mixing Zone:	3.16982	0.20644	#VALU	#VALU	12.7018	2.81502	0.27419	#VALU	#VALU	0.22119	119.745
	9	5	E	E	5	2	1	E	E	1	8
Chronic - Concentration of Pollutant at the Edge of the Mixing Zone:	1.46021	0.02727	#VALU	#VALU	1.67790	0.37186	0.03622	#VALU	#VALU	0.02921	20.2446
	2	1	E	E	5	2	0	E	E	9	3
Potential to Violate Acute Criteria at the Edge of the Mixing Zone:	NO RP	NO RP	#VAL UE	#VAL UE	YES	NO RP	NO RP	#VAL UE	#VAL UE	NO RP	YES
Potential to Violate Chronic Criteria at the Edge of the Mixing Zone:	NO RP	NO RP	#VAL UE	#VAL UE	NO RP	NO RP	YES	#VAL UE	#VAL UE	---	NO RP
	Arsenic	Cadmium	Hex	Tri	Copper	Lead	Mercury	Nickel	Selenium	Silver	Zinc
			Chromium								

FACT SHEET FOR NPDES PERMIT NO. WA0023353
CITY OF SUMNER WASTEWATER TREATMENT FACILITY

Water Quality-Based Permit Limits for acute and chronic criteria (Based on EPA/505/2-90-001 Box 5-2) and Lotus File WQBP2.WK1 (Revised 19-Oct-93).

Notes: City of Sumner Metals Determination Design Flow < 2.62 MGD

INPUT											
1. Water Quality Standards (Concentration)	Arsenic	Cadmium	Chromium		Copper	Lead	Mercury	Nickel	Selenium	Silver	Zinc
		m	Hex	Tri			y		m		
Acute (one-hour) Criteria:	360	2.406	15.275	1217.81	11.785	47.034	2.471	983.044	20	1.927	81.067
Chronic (n-day) Criteria:	190	0.438	10.395	76.670	4.195	0.680	0.012	56.521	5	---	37.937
2. Upstream Receiving Water Concentration											
Upstream Conc for Acute Condition (7Q10): 95th%-tile	1.2	0	0	0	0	0	0	0	0	0	5.1
Upstream Conc for Chronic Condition (7Q10): 90th%-tile	1.2	0	0	0	0	0	0	0	0	0	5.1
3. Dilution Factors (1/{Effluent Volume Fraction})											
Acute Receiving Water Dilution Factor at 7Q10:	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75
Chronic Receiving Water Dilution Factor at 7Q10:	13.27	13.27	13.27	13.27	13.27	13.27	13.27	13.27	13.27	13.27	13.27
4. Coefficient of Variation for Effluent Concentration (use 0.6 if data are not available):	0.600	0.600	0.600	0.600	0.480	0.490	0.600	0.600	0.600	0.600	0.750
5. Number of days (n1) for chronic average (usually four or seven; four is recommended):	4	4	4	4	4	4	4	4	4	4	4
6. Number of samples (n2) required per month for monitoring:	1	1	1	1	1	1	1	1	1	1	1
OUTPUT											
1. Z Statistics											
LTA Derivation (99%tile):	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Daily Maximum Permit Limit (99%tile):	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Monthly Average Permit Limit (95%tile):	1.645	1.645	1.645	1.645	1.645	1.645	1.645	1.645	1.645	1.645	1.645
2. Calculated Waste Load Allocations											

FACT SHEET FOR NPDES PERMIT NO. WA0023353
CITY OF SUMNER WASTEWATER TREATMENT FACILITY

(WLA's)

Acute (one-hour) WLA:	630.244	4.21806	26.7798	2135.05	20.6606	82.4593	4.33141	1723.46	35.0638	3.37757	138.284
	7	1	9	7	4	7	1	3	0	8	8
Chronic (n1-day) WLA:	2506.90	5.80942	137.960	1017.54	55.6780	9.01937	0.15926	750.132	66.3588	0	440.902
	9	5	1	7	8	7	1	4	4		0

3. Derivation of LTAs using April 1990 TSD (Box 5-2 Step 2 &

3)

Sigma^2:	0.30748	0.30748	0.30748	0.30748	0.20733	0.21519	0.30748	0.30748	0.30748	0.30748	0.44628
	4	4	4	4	9	2	4	4	4	4	7
Sigma^2-n1:	0.08617	0.08617	0.08617	0.08617	0.05600	0.05829	0.08617	0.08617	0.08617	0.08617	0.13157
	7	7	7	7	2	2	7	7	7	7	6
LTA for Acute (1-hour) WLA:	202.360	1.35434	8.59857	685.531	7.94678	31.2149	1.39074	553.375	11.2584	1.08448	36.5463
	9	8	4	1	5	9	3	1		3	4
LTA for Chronic (n1-day) WLA:	1322.22	3.06408	72.7648	536.688	33.0210	5.29591	0.08399	395.644	34.9998	0	202.530
	8	5	0	5	3	5	9	9	7		4
Most Limiting LTA (minimum of acute and chronic):	202.360	1.35434	8.59857	536.688	7.94678	5.29591	0.08399	395.644	11.2584	1.08448	36.5463
	9	8	4	5	5	5	9	9		3	4

4. Derivation of Permit Limits From Limiting LTA (Box 5-2

Step 4)

Sigma^2-n2:	0.30748	0.30748	0.30748	0.30748	0.20733	0.21519	0.30748	0.30748	0.30748	0.30748	0.44628
	4	4	4	4	9	2	4	4	4	4	7
Daily Maximum Permit Limit:	630.244	4.21806	26.7798	1671.49	20.6606	13.9900	0.26161	1232.21	35.0638	3.37757	138.284
	7	1	9	3	4	0	3	9	0	8	8
Monthly Average Permit Limit:	432.025	2.89143	18.3573	1145.78	15.1521	10.2004	0.17933	844.672	24.0358	2.31529	87.7397
	5	3	1	9	2	8	3	2	4	1	7

Arsenic	Cadmiu	Hex	Tri	Copper	Lead	Mercur	Nickel	Seleniu	Silver	Zinc
	m					y		m		
		Chromium								

FACT SHEET FOR NPDES PERMIT NO. WA0023353
CITY OF SUMNER WASTEWATER TREATMENT FACILITY

Determining the Requirement for Permit Limits Through a Reasonable Potential Determination to Violate Standards at the Edge of the Mixing Zone.

Based on EPA/505/2-90-001

Notes: City of Sumner Metals Determination Design Flow < 3.43
MGD

INPUT											
	Arsenic	Cadmium	Chromium		Copper	Lead	Mercury	Nickel	Selenium	Silver	Zinc
		m	Hex	Tri			y		m		
Confidence Level and Probability Basis:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Coefficient of Variation for the Effluent Concentration (CV)											
(0.6 or a calculated CV if there are more than 10 data points):	0.6	0.6	0.6	0.6	0.48	0.49	0.6	0.6	0.6	0.6	0.75
Number of Effluent Samples or Data Points (ND):	4	4	0	0	68	62	68	0	0	4	62
Highest Effluent Concentration or Value (HV):	1.8	0.14	0	0	23	5	0.5	0	0	0.15	210
Dilution Factors (1/{Effluent Volume Fraction}) or plumes model											
Acute Receiving Water Dilution Factor:	1.58	1.58	1.58	1.58	1.58	1.58	1.58	1.58	1.58	1.58	1.58
Chronic Receiving Water Dilution Factor:	10.37	10.37	10.37	10.37	10.37	10.37	10.37	10.37	10.37	10.37	10.37
Water Quality Standards (Concentration)											
Acute (one-hour) Criteria:	360	2.598	15.275	1287.61	12.565	51.290	2.471	1041.30	20	2.166	83.989
				3				0			
Chronic (n-day) Criteria:	190	0.455	10.395	79.807	4.374	0.723	0.012	58.911	5	---	38.990
Upstream Receiving Water Concentration:											
Upstream Concentration for Acute Condition (7Q10):	1.2	0	0	0	0	0	0	0	0	0	5.1
Upstream Concentration for Chronic Condition (7Q10):	1.2	0	0	0	0	0	0	0	0	0	5.1
MECB: 1-9 data points, multiply highest value by 2; 10-50 use highest value; >50 calculate 90th %-tile											
OUTPUT											

Percentile Represented by the Highest Concentration in Data Set

FACT SHEET FOR NPDES PERMIT NO. WA0023353
CITY OF SUMNER WASTEWATER TREATMENT FACILITY

(p _n) = (1 - confidence level) ¹ /ND	0.47287	0.47287	---	---	0.95690	0.95283	0.95690	---	---	0.47287	0.95283
	0	0			1	0	1			0	0
Normal Distribution Value for 95th Percentile	1.64485	1.64485	1.64485	1.64485	1.64485	1.64485	1.64485	1.64485	1.64485	1.64485	1.64485
	3	3	3	3	3	3	3	3	3	3	3
Normal Distribution Value for XXth Percentile	-	-	---	---	1.71580	1.67294	1.71580	---	---	-	1.67294
	0.06805	0.06805			7	2	7			0.06805	2
s ² = ln(CV ² +1)	0.30748	0.30748	0.30748	0.30748	0.20733	0.21519	0.30748	0.30748	0.30748	0.30748	0.44628
	4	4	4	4	9	2	4	4	4	4	7
C95 = exp(1.645Sigma -0.5Sigma ²)	2.13475	2.13475	2.13475	2.13475	1.90657	1.92597	2.13475	2.13475	2.13475	2.13475	2.40054
	1	1	1	1	1	3	1	1	1	1	5
CXX = exp(XX Sigma -0.5Sigma ²)	0.82573	0.82573	---	---	1.96917	1.95123	2.22041	---	---	0.82573	2.44601
	6	6			5	3	7			6	7
Reasonable Potential Multiplier = C95/CXX	2.59	2.59	---	---	0.97	0.99	0.96	---	---	2.59	0.98
Maximum Expected Concentration of Pollutant in Effluent (MEC):	4.65348	0.36193	#VALU	#VALU	22.2687	4.93527	0.48070	#VALU	#VALU	0.38779	206.096
	5	7	E	E	7	0	9	E	E	0	0
Acute - Concentration of Pollutant at the Edge of the Mixing Zone:	3.39223	0.22975	#VALU	#VALU	14.1360	3.13286	0.30514	#VALU	#VALU	0.24616	132.690
	9	4	E	E	0	1	9	E	E	5	3
Chronic - Concentration of Pollutant at the Edge of the Mixing Zone:	1.53290	0.03488	#VALU	#VALU	2.14664	0.47574	0.04633	#VALU	#VALU	0.03738	24.4754
	5	9	E	E	2	5	8	E	E	1	0
Potential to Violate Acute Criteria at the Edge of the Mixing Zone:	NO RP	NO RP	#VAL	#VAL	YES	NO RP	NO RP	#VAL	#VAL	NO RP	YES
			UE	UE				UE	UE		
Potential to Violate Chronic Criteria at the Edge of the Mixing Zone:	NO RP	NO RP	#VAL	#VAL	NO RP	NO RP	YES	#VAL	#VAL	---	NO RP
			UE	UE				UE	UE		
	Arsenic	Cadmium	Hex	Tri	Copper	Lead	Mercury	Nickel	Selenium	Silver	Zinc
			Chromium								

FACT SHEET FOR NPDES PERMIT NO. WA0023353
CITY OF SUMNER WASTEWATER TREATMENT FACILITY

Water Quality-Based Permit Limits for acute and chronic criteria (Based on EPA/505/2-90-001 Box 5-2) and Lotus File WQBP2.WK1 (Revised 19-Oct-93).

Notes: City of Sumner Metals Determination Design Flow < 3.43 MGD

INPUT											
1. Water Quality Standards (Concentration)	Arsenic	Cadmium	Chromium		Copper	Lead	Mercury	Nickel	Selenium	Silver	Zinc
			Hex	Tri							
Acute (one-hour) Criteria:	360	2.598	15.275	1287.61	12.565	51.290	2.471	1041.30	20	2.166	83.989
Chronic (n-day) Criteria:	190	0.455	10.395	79.807	4.374	0.723	0.012	58.911	5	---	38.990
2. Upstream Receiving Water Concentration											
Upstream Conc for Acute Condition (7Q10): 95th%-tile	1.2	0	0	0	0	0	0	0	0	0	5.1
Upstream Conc for Chronic Condition (7Q10): 90th%-tile	1.2	0	0	0	0	0	0	0	0	0	5.1
3. Dilution Factors (1/{Effluent Volume Fraction})											
Acute Receiving Water Dilution Factor at 7Q10:	1.58	1.58	1.58	1.58	1.58	1.58	1.58	1.58	1.58	1.58	1.58
Chronic Receiving Water Dilution Factor at 7Q10:	10.37	10.37	10.37	10.37	10.37	10.37	10.37	10.37	10.37	10.37	10.37
4. Coefficient of Variation for Effluent Concentration (use 0.6 if data are not available):	0.600	0.600	0.600	0.600	0.480	0.490	0.600	0.600	0.600	0.600	0.750
5. Number of days (n1) for chronic average (usually four or seven; four is recommended):	4	4	4	4	4	4	4	4	4	4	4
6. Number of samples (n2) required per month for monitoring:	1	1	1	1	1	1	1	1	1	1	1
OUTPUT											
1. Z Statistics											
LTA Derivation (99%tile):	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Daily Maximum Permit Limit (99%tile):	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326	2.326
Monthly Average Permit Limit (95%tile):	1.645	1.645	1.645	1.645	1.645	1.645	1.645	1.645	1.645	1.645	1.645
2. Calculated Waste Load Allocations											

(WLA's)

3. Derivation of LTAs using April 1990 TSD (Box 5-2 Step 2 &

3)

4. Derivation of Permit Limits From Limiting LTA (Box 5-2)

Step 4)

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APPENDIX D--RESPONSE TO COMMENTS

This response to comments (RTC) is an appendix to the fact sheet for the above referenced National Pollutant Discharge Elimination System (NPDES) permit. The RTC summarizes comments received during the 30-day public notice and comment period on the draft permit, and provides the Department of Ecology (Department) response. All changes to the draft permit are noted below. The Department has determined to issue this permit as revised.

Comments were received from Citizens for a Healthy Bay (CHB).

CHB Comments:

1. **Comment:**

Concentration limits proposed in the draft permit for ammonia and copper are less stringent than in the previous permit. The intent of the Clean Water Act is that each permit will be more protective of human and environmental health than the previous permit. Monitoring data indicate that the facility does not require more lenient limits for ammonia and copper. We therefore support the more stringent limits and oppose the more lenient limits proposed in the draft permit.

Response:

The limits for Total Ammonia (as $\text{NH}_3\text{-N}$) for November through April and Total Recoverable Copper were recalculated using additional data collected since the last permit issuance. As more data is collected on effluent and ambient water quality, permit limits based on more complete information may be developed for the City of Sumner WWTF. No change to permit.

2. **Comment:**

The draft permit requires only monthly testing for mercury, copper, and zinc. This makes the proposed maximum daily concentration limits meaningless. It is difficult to characterize a WWTF discharge with only one sample per month, and previous monitoring data showed a wide range of results. We request that the facility be required to collect weekly samples for these pollutants for the first year of the new permit, and that Ecology make a determination on future monitoring requirements based on those data.

Response:

Ecology takes into account the size and design capacity of the facility, type of treatment, variability of the concentration of the parameter, compliance history, cost of monitoring and other factors when determining sampling frequencies. Ecology typically requires monthly sampling for metals for facilities with the size and complexity of the Sumner WWTF. Results from DMRs for the City of Sumner show that the coefficient of variation for copper is 0.48, mercury 0.85, and zinc 0.75, which does not represent widely varying results for these environmental parameters. No change to permit.

3. **Comment:**

The fact sheet should, but does not describe the lateral or longitudinal extent of the mixing zone. The proposed mixing zone must be smaller than any mixing zone previously granted for metals, and the facility should plan to eventually eliminate that mixing zone and meet water quality standards. Ecology has a strategy for continually reducing persistent, bioaccumulative, toxic chemicals and has identified mercury as a priority pollutant. One of the proposed objectives of the strategy is to eliminate mixing zones for such chemicals. The Great Lakes region has already taken this step.

Response:

The following language will be added to the fact sheet describing the size of the mixing zone to reflect information given in Special Condition S1.C of the permit.

MIXING ZONE DESCRIPTIONS

The maximum boundaries of the mixing zones are defined as follows:

Length:

Chronic: 100 feet upstream, 304 feet downstream.

Acute: 10 feet upstream, 31 feet downstream.

Width:

36 feet (18 feet each side from centerline of outfall port).

4. **Comment:**

The proposed allowable annual loadings of mercury, copper, and zinc are substantial, and we believe that a sediment quality study would be prudent before problems are identified. The draft Fact Sheet states (page 14) that “The Department has been unable to determine at this time the potential for this discharge to cause a violation of sediment quality standards.” The metals are likely to accumulate, and we request that the facility include sampling the sediments both upstream and downstream from the outfall in its receiving water study plan.

Response:

There is no information available that indicates that the White River has any problems with sediments and no reason to believe that the Sumner WWTF discharge would pose any greater risk than any other POTW discharge. Therefore a sediment study will not be required in this permit. No change to permit.

5. **Comment:**

The allowable load of ammonia proposed in the draft permit is equal to the full amount of the waste load allocation determined in the recent Total Maximum Daily Load settlement. Ecology’s preliminary monitoring data indicate that the reserve capacity for ammonia may not be available in the river. We encourage Ecology and the City of Sumner, with its partners in Bonney Lake and Pierce County, to work together to continue to improve treatment methods and technology at the facility and avoid any plans to access the initially allocated reserve capacity. We will happily provide letters of support for any grant requests to fund such efforts.

Response:

As you may know the Sumner WWTF is scheduled for a major upgrade which will greatly improve its treatment capabilities. Comment noted.

6. **Comment:**

New water quality standards for dissolved oxygen and temperature will be in place later this year. We would like to know how the facility proposes to meet those new standards without extending its existing mixing zone. Ecology is also in the process of moving from fecal coliform to enterococcus bacteria standards, and the revised final permit should include language requiring the facility to collect and analyze enterococci samples at some point during this permit cycle.

Response:

During this permit renewal it was determined that the current dissolved oxygen and temperature standards would not have a reasonable potential to be violated as a result of discharges from the Sumner WWTF. Ecology is currently looking for WWTFs to participate in a study to collect enterococci samples and Sumner is a candidate for participation in that study. No change to permit.

7. **Comment:**

The receiving water study should be done in full coordination with Puget Sound Energy and timed with their releases from Lake Tapps. New data being collected downstream by the University of Washington, Tacoma for Ecology's Total Maximum Daily Load work group may help in deciding what conditions should be targeted as "critical." We suggest that the facility contact Jeannette Barreca at Ecology or Jim Gawel at UW-Tacoma for more information about this monitoring effort.

Because this information might be used in a permit modification, we request that the receiving water study (S8) be performed earlier than indicated in the draft permit. We specifically request that the study be done in 2002 or, at the latest, in 2003. Ecology needs adequate time to review and consider results of such studies in order to meaningfully apply the studies' conclusions to regulatory decisions. It would be helpful for the data to be collected and analyzed as early as possible in the permit cycle.

As part of the receiving water and toxicity studies (S8, S9, S10), we suggest that an analysis be made to determine the portion of the total recoverable mercury that is bioavailable. We also suggest that periodic analyses for bioavailable mercury be made in samples collected from the WWTF effluent.

Response:

A quality assurance project (QAPP) is to be submitted 120 days from issuance of the permit. The QAPP outlines the sampling protocol. The receiving water study is to be conducted twice a year for the next five years during low flow in the White River in order to collect sufficient ambient data to perform a reasonable potential analysis for metals, ammonia, pH, and dissolved oxygen for the next permit renewal. Data from the studies mentioned above may also be used in developing permit limits for the next permit. No

change to permit. A final report summarizing the data from the ten sampling runs is due at the time of reapplication for the next permit.

8. **Comment:**

The 2005 dates listed for submittal of documents pursuant to sections S9 and S10 in the draft permit are beyond the dates scheduled for the next Water Quality Management Area permit issuance (July 1, 2003 to June 30, 2004). We request that the dates for acute and chronic toxicity testing and reporting be moved back accordingly.

Response:

The draft permit will expire in the summer of 2006 and will be reissued at that time. The results of the toxicity test are to be available for the next permit renewal. No change to permit.

9. **Comment:**

For clarification, you should add the flow range of 2.62 to 3.43 MGD to the section heading S1B. The average flow for the maximum month in S4A2 should read 3.43 MGD, not 3.42 MGD.

Response:

The heading for special condition S1B will be changed to read:

B. Effluent Limitations (Flow >2.62 MGD and < 3.43 MGD)

and, the average flow for the maximum month in S4A2 will be changed to 3.43 MGD.